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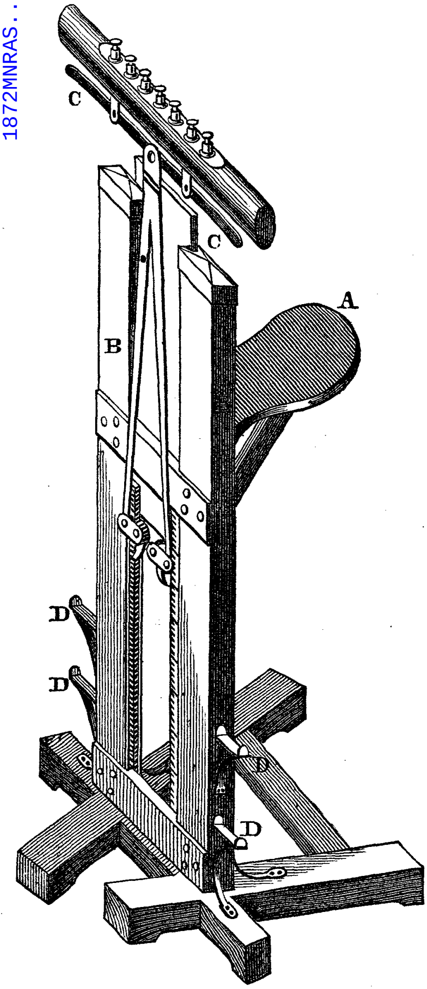
Knobel. I have, however, at his kindly expressed wish, introduced several modifications which he thinks will add to its usefulness, before bringing the contrivance forward for practical use.



The seat A, on which the observer sits astride, is rather more than counterbalanced by two weights attached to cords which hang from pulleys at the top of the uprights, and the weights run down the uprights B B, which are made hollow for the purpose; the chair is always locked automatically, but can be released by the observer clasping either of the small metal handles C C underneath the main bar at the top which moves with the seat. On releasing the cams by means of either of these handles, and simply raising himself from the seat, by resting his feet on the projecting brackets D, D, D, D, the seat will itself rise in position, while by allowing his weight to rest gently on the seat while either of the cam levers are held, he can lower the seat to the full extent of the actions.

On a Modified Form of Solar Eye-piece.

By John Browning.

Having been recently engaged in constructing several solar eye-pieces, the object in each case being to produce an eye-piece which would reflect to the eye of the observer fewer rays than those in general use, I came to the conclusion that the ordinary form of solar eye-piece, that is, with a single-surface reflexion from a prism or prisms, has not hitherto been made in the most efficient form.

It must upon the slightest consideration be at once evident that instead of presenting the surface of each prism to the light at an angle of 45°, so that the light should be reflected at an angle of 90° from the surface, that much more light would be transmitted, and much less reflected if the prism were presented to the light at an angle of nearly 90°, or as near as the difficulties of practical construction would admit of.

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I have made an eye-piece on this principle, and the advantage over those in ordinary use is very great. The instrument I have made and tried I have now the honour of exhibiting to the Members of the Society.

Description of a Prismatic Solar Eye-piece.

By John E. Ingpen.

(*Communicated by John Browning.*)

A B C is a prism, having all three surfaces polished; the angle at A is about 45°. A ray of sunlight, D E, from the object-glass of the telescope enters the prism perpendicularly to A B, and is totally reflected from E to F, where a large portion of the light and heat is refracted in the direction F I. The rest is reflected to G, and again totally reflected to H, where it emerges perpendicularly to A C, and is viewed by the eye-piece.

The larger the angle B A C (provided it is less than 60°), the greater the amount of light and heat that is got rid of.

This eye-piece is cool and pleasant in use, but the prism must be very perfect both in material and surface; and even then it is doubtful whether the finest definition can be obtained. It may, however, prove useful in certain cases.

On the Diffraction of Object-glasses. By the Hon. J. W. Strutt, M.A., F.R.A.S.

In observing the Sun with a telescope astronomers have to adopt some device in order to obviate the injurious effects of which the intense light and heat would otherwise have on the eye. The most obvious way of doing this would be to contract the aperture of the object-glass, until the amount of light was reduced to within the necessary limit. But, as is well known, such a course cannot be followed without an enormous sacrifice of definition. The image in the focus of the object-glass of a mathematical point, is a patch of light surrounded by rings, the dimensions of the system for a given wave-length varying inversely with the diameter of the lens. If this be reduced by a diaphragm, the patches dilate, those whose centres are within a small distance overlap, and the resolving power of the telescope suffers.

It has occurred to me that the result would be quite otherwise if, instead of the marginal, the central parts of the glass were stopped off, so that the light, coming from the lens to the focus, formed a hollow cone of rays. In this case the peculiar advantage of a large aperture would not be lost, while any imperfections arising from outstanding spherical aberration would be much diminished.

The general dependence of the diffraction phenomena which occur at the focus of a telescope on the aperture and wave-length,

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